

REMARKS

The present application has been reviewed in light of the Office Action dated May 19, 2003. New Claims 19-53 are presented for examination and have been added to provide Applicants with a more complete scope of protection. Claims 19, 27, 29, 31, 33, 35-37, and 39-53 are in independent form. Claims 1-18 have been cancelled, without prejudice or disclaimer of the subject matter presented therein. Favorable reconsideration is requested.

As an initial matter, a Request For Approval Of Drawing Changes was filed on January 24, 2000, in which approval is requested to change Fig. 11 to add a line connecting the output of the smoothing unit 802 to a second input of the subtraction unit 805. The present Office Action does not address the Request and, accordingly, Applicants hereby renew the request for approval of the change to Fig. 11.

The Office Action states that Claims 1-18 are rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,101,273 (Matama). Cancellation of those claims renders their rejections moot. Applicants submit that new independent Claims 19, 27, 29, 31, 33, 35-37, and 39-53, together with the claims dependent therefrom, are patentably distinct from Matama for at least the following reasons.

The present invention relates to an apparatus, method, and program for converting a gradation of an image while maintaining a high-frequency component of the image. This is especially useful for (but not limited to) processing of medical images, as discussed on the first page of the specification, for example.

An aspect of the present invention set forth in Claim 19 is directed to an image processing apparatus that changes a dynamic range of an original image. The apparatus includes a gradation conversion unit, a high-frequency-component generation unit, a conversion unit, and a control unit.

The gradation conversion unit is adapted to perform a gradation conversion on the original image, based on a gradation conversion curve. The high-frequency-component generation unit is adapted to generate a high-frequency component of the original image or an image obtained from the gradation conversion performed on the original image by the gradation conversion unit. The conversion unit is adapted to convert a magnitude of an amplitude of the high-frequency component. The control unit is adapted to control an addition of the high-frequency component converted by the conversion unit, after performance of the gradation conversion on the original image by the gradation conversion unit. The conversion unit converts the magnitude of the amplitude of the high-

frequency component, based on information concerning an inclination of the gradation conversion curve.

One of the notable features of Claim 19 is that a gradation conversion is performed on an image based on a gradation conversion curve. A high-frequency component is generated, and a magnitude of an amplitude of the high-frequency component is converted based on information concerning an inclination of the gradation conversion curve. The converted high-speed component is then added to the converted image. By virtue of this feature, it is possible to change a dynamic range of the image without changing the magnitude of the amplitude of the high-frequency component of the image. More particularly, the gradation conversion is performed on the image using the gradation conversion curve, to which it is then added the high-frequency component whose magnitude of the amplitude has been converted based on the information concerning the inclination of the gradation conversion curve.

Matama relates to a system for processing a digital image signal. As understood by Applicants, Matama discloses compressing a dynamic range of an original image by subtracting a low-frequency component from the original image. A high-frequency component then is generated and added to the image after gradation conversion of the image.

Nothing has been found in Matama that is believed to teach or suggest an image processing apparatus that includes "a gradation conversion unit adapted to perform a gradation conversion on the original image, based on a gradation conversion curve," and "a high-frequency-component generation unit adapted to generate a high-frequency component of the original image or an image obtained by performing the gradation conversion on the original image by said gradation conversion unit," and "a conversion unit adapted to convert a magnitude of an amplitude of the high frequency component," and "a control unit adapted to control an addition of the high-frequency component converted by said conversion unit, after performance of the gradation conversion on the original image by said gradation conversion unit," wherein "said conversion unit converts the magnitude of the amplitude of the high-frequency component, based on information concerning an inclination of the gradation conversion curve," as recited in Claim 19.

Applicants respectfully submit that Matama is silent regarding converting a magnitude of an amplitude of a high-frequency component based on information concerning an inclination of a gradation conversion curve, and also is silent regarding converting a gradation of an image based on a gradation conversion curve. Accordingly, Applicants submit that Claim 19 is patentable over Matama.

Independent Claims 27, 29, 31, 33, 35-37, and 39-53 include a feature similar to that discussed above, in which a gradation of an image is converted based on a gradation conversion curve. Therefore, those claims also are believed to be patentable for at least the same reasons as discussed above.

The other claims in the present application depend from one or another of the independent claims discussed above and therefore are submitted to be patentable for at least the same reasons. Since each dependent claim is also deemed to define an additional aspect of the invention, individual consideration of the patentability of each claim on its own merits is respectfully requested.

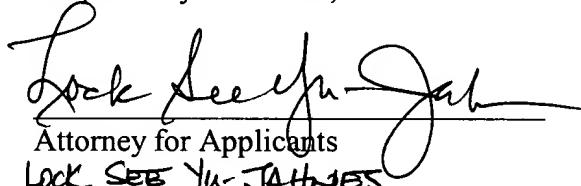
In view of the foregoing amendments and remarks, Applicants respectfully request favorable reconsideration and early passage to issue of the present application.

No petition to extend the time for response to the Office Action is deemed necessary for the present Amendment. If, however, such a petition is required to make this Amendment timely filed, then this paper should be considered such a petition and the Commissioner is authorized to charge the requisite petition fee to Deposit Account 06-1205.

CONCLUSION

Applicants' undersigned attorney may be reached in our New York office by telephone at (212) 218-2100. All correspondence should continue to be directed to our below listed address.

Respectfully submitted,


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